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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,809	11/21/2003	David Earl Schafer	30521/3055	3297

4743 7590 09/14/2005

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EXAMINER

ENSEY, BRIAN

ART UNIT	PAPER NUMBER
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2646

DATE MAILED: 09/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/719,809	SCHAFER ET AL.	
	Examiner	Art Unit	
	Brian Ensey	2646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 33-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/16/04 & 5/04/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: See Fig. 5 item 504. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13 and 14 recites the limitation "the resonant frequency" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Besson GB Patent Publication 1,057,853.

Regarding claim 1, Besson discloses a diaphragm (22) for a receiver, the receiver having a linkage assembly (21) and an armature (8) coupled thereto, the armature having a first inertial mass, the diaphragm comprising: an attachment point for connectively coupling to the linkage assembly; and a paddle (25), responsive to a movement of the linkage assembly, the paddle generally flat, having an upper surface and a lower surface, the paddle defining a plane, the paddle for creating sound pressure according to the movement of the linkage assembly, wherein the paddle has a second inertial mass such that momentum created by a movement of the armature is approximately equal to a momentum created by movement of the diaphragm (See Fig. 2 and page 1 lines 9-62).

Regarding claim 2, Besson further discloses the paddle further comprises: a first layer having a first upper surface and a first lower surface; and a second layer having a second upper surface and a second lower surface, the second upper surface in contact with the first lower

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surface, wherein at least one of the layers is one of a metal and a composite (See page 1, lines 57-62).

Regarding claim 3, Besson further discloses the paddle has an adhesive between the first and second layers (See page 1, lines 57-62).

Regarding claim 4, Besson further discloses the metal is one of aluminum, titanium, tungsten, stainless steel, copper, brass beryllium copper and platinum (See page 1, lines 57-62).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5-7 and 9-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Besson in view of Broersma U.S. Patent No. 4,126,769.

Regarding claims 5 and 6, Besson discloses a diaphragm as claimed. Besson does not expressly disclose the first layer is thicker than the second layer and the first lower surface is larger than the second upper surface. However, Besson teaches disclose the second layer is thicker than the first layer and the first lower surface is smaller than the second upper surface (See Fig. 2 and page 2, lines 9-16). Further, Broersma teaches varying the diaphragm and paddle dimensions to provide optimum operating efficiency (See Fig. 1 and col. 3, lines 63-68). These variations are merely a reversal of dimensional structure and it would have been obvious to one of ordinary skill in the art at the time of the invention to vary the dimensional structure to vary microphone response.

Regarding claims 7 and 9, Besson further discloses the first upper surface is corrugated thereby increasing rigidity (See Figs. 2 and 3 and page 2, lines 20-23). Besson does not expressly disclose the corrugation raises the resonant frequency of the diaphragm. However, it is well known in the art that an increase in the diaphragm rigidity will increase its resonant frequency. Official Notice taken. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the disclosed corrugation provides the benefit of increased rigidity and increased resonant frequency.

Regarding claim 10, Besson discloses a first layer having a first upper surface and a first lower surface; a second layer having a second upper surface and a second lower surface, and a third layer having a third upper surface and a third lower surface, wherein the second upper surface in contact with the first lower surface, the second lower surface in contact with the third upper surface, wherein the second layer is one of a cement for securing the thin film layer to the aluminum stiffening plate (See lines 57-62). Broersma further teaches a second layer of a

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suitable adhesive for securing an upper and lower layer together (See col. 2, lines 60-65).

Adhesives comprised of thermoplastic, thermo set, polyimide and epoxy are well known in the art and it would have been obvious to one of ordinary skill in the art at the time of the invention to use any of these well known adhesives to secure the upper and lower layers of the vibrating paddle of Besson.

Regarding claims 11 and 12, Besson discloses a diaphragm as claimed. Besson teaches a second layer (cement) provides spacing between the first and third layer (See lines 57-62). Besson further teaches the second layer is cement while the third layer is aluminum and the first layer is 0.00025 inch thick Mylar (See page 3, lines 9-15). Besson does not expressly disclose the second layer is of a lower density than at least one of the other layers and a thickness of the first layer is between 10% and 200% of the thickness of the second layer. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the diaphragm to provide improvement with regard to the higher part of the frequency range (See col. 1, lines 19-31).

Regarding claims 13 and 14, Besson does not expressly disclose the resonant frequency of the diaphragm is above 14 KHz. However, Broersma teaches a resonant frequency range of 7 kHz to 10 kHz (See col. 1, lines 32-37). The resonant frequency is directly related to the stiffness and composition of the diaphragm and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the diaphragm to provide improvement with regard to the higher part of the frequency range (See col. 1, lines 19-31).

Regarding claims 15 and 21, Besson discloses a diaphragm (22) for a receiver, the receiver having a linkage assembly (21) and an armature (8) coupled thereto, the armature

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having a first inertial mass, the diaphragm comprising: an attachment point for connectively coupling to the linkage assembly; and a paddle (25), responsive to a movement of the linkage assembly, the paddle generally flat, having an upper surface and a lower surface, the paddle defining a plane, the paddle for creating sound pressure according to the movement of the linkage assembly, wherein the paddle has a second inertial mass such that momentum created by a movement of the armature is approximately equal to a momentum created by movement of the diaphragm (See Fig. 2 and page 1 lines 9-62). Besson does not expressly disclose the paddle has a lowest frequency resonance greater than 7.5 KHz. However, Broersma teaches a resonant frequency range of 7 kHz to 10 kHz (See col. 1, lines 32-37). The resonant frequency is directly related to the stiffness and composition of the diaphragm, therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the diaphragm of Besson as taught by Broesma to provide improvement with regard to the higher part of the frequency range (See col. 1, lines 19-31).

Regarding claims 16 and 22, the combination of Besson in view of Broersma further discloses a first layer having a first upper surface and a first lower surface; and a second layer having a second upper surface and a second lower surface, the second upper surface in contact with the first lower surface, wherein at least one of the layers is one of a metal and a composite (See page 1, lines 57-62).

Regarding claims 17 and 23, Besson further discloses the metal is one of aluminum, titanium, tungsten, stainless steel, copper, brass, beryllium copper and platinum composite (See page 1, lines 57-62).

Regarding claims 18 and 29, Besson discloses a first layer having a first upper surface and a first lower surface; a second layer having a second upper surface and a second lower surface, and a third layer having a third upper surface and a third lower surface, wherein the second upper surface is in contact with the first lower surface, the second lower surface is in contact with the third upper surface, wherein the second layer is one of a cement for securing the thin film layer to the aluminum stiffening plate (See lines 57-62). Broersma further teaches a second layer of a suitable adhesive for securing an upper and lower layer together (See col. 2, lines 60-65). Adhesives comprised of thermoplastic, thermo set, polyimide and epoxy are well known in the art and it would have been obvious to one of ordinary skill in the art at the time of the invention to use any of these well known adhesives to secure the upper and lower layers of the vibrating paddle of Besson.

Regarding claims 19, 20, 30 and 31, Besson discloses a diaphragm as claimed. Besson teaches a second layer (cement) provides spacing between the first and third layer (See lines 57-62). Besson further teaches the second layer is cement while the third layer is aluminum and the first layer is 0.00025 inch thick Mylar (See page 3, lines 9-15). Besson does not expressly disclose the second layer is of a lower density than at least one of the other layers and a thickness of the first layer is between 10% and 200% of the thickness of the second layer. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the diaphragm to provide improvement with regard to the higher part of the frequency range (See col. 1, lines 19-31).

Regarding claims 24 and 25, Besson discloses a diaphragm as claimed. Besson does not expressly disclose the first layer is thicker than the second layer and the first lower surface is

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larger than the second upper surface. However, Besson teaches disclose the second layer is thicker than the first layer and the first lower surface is smaller than the second upper surface (See Fig. 2 and page 2, lines 9-16). Further, Broersma teaches varying the diaphragm and paddle dimensions to provide optimum operating efficiency (See Fig. 1 and col. 3, lines 63-68). These variations are merely a reversal of dimensional structure and it would have been obvious to one of ordinary skill in the art at the time of the invention to vary the dimensional structure to vary microphone response.

Regarding claims 26 and 28, Besson further discloses the first upper surface is corrugated thereby increasing rigidity (See Figs. 2 and 3 and page 2, lines 20-23). Besson does not expressly disclose the corrugation raises the resonant frequency of the diaphragm. However, it is well known in the art that an increase in the diaphragm rigidity will increase its resonant frequency. Official Notice taken. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the disclosed corrugation provides the benefit of increased rigidity and increased resonant frequency.

Regarding claim 32, Besson does not expressly discloses the resonant frequency of the diaphragm is above 14 KHz. However, Broersma teaches a resonant frequency range of 7 kHz to 10 kHz (See col. 1, lines 32-37). The resonant frequency is directly related to the stiffness and composition of the diaphragm and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the diaphragm to provide improvement with regard to the higher part of the frequency range (See col. 1, lines 19-31).

Claims 8 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Besson in view of Broersma as applied to claims 1 and 21 above, and further in view of Dolleman et al U.S. Patent No. 6,078,677.

Regarding claims 8 and 27, Besson discloses a diaphragm as claimed. Besson does not expressly disclose the paddle has an edge portion formed to be out of the plane thereby increasing rigidity and raising a resonant frequency of the diaphragm. However, Dolleman discloses a multilayered diaphragm where an edge portion formed to be out of the plane (See Fig. 2 and col. 5, lines 58-65). It would have been obvious to one of ordinary skill in the art at the time of the invention that an edge formed out of the flat planar surface increases diaphragm rigidity and an increase in the diaphragm rigidity will increase its resonant frequency.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Ensey whose telephone number is 571-272-7496. The examiner can normally be reached on Monday - Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


SINH TRAN
SUPERVISORY PATENT EXAMINER

BKE
September 9, 2005